

"Made available under NASA sponsorship
in the interest of early and wide dis-
semination of Earth Resources Survey
Program information and without liability
for any use made thereof."

E72-10185
CR-128383

November 10, 1972

ERTS Contracting Officer
Code 245, GSFC
Greenbelt, Maryland 20771

Subject: Type I Progress Report No. 2

Period Covered: 1 September - 31 October 1972

Title: A Scheme for the Uniform Mapping and Monitoring of
Earth Resources and Environmental Complexes Using
ERTS-1 Imagery

GSFC ID: PR 534

Objectives

To develop, test and specify a practical procedure and system for
the uniform mapping and monitoring of natural ecosystems and environmental
complexes from space-acquired imagery.

With primary emphasis on ERTS-A imagery, but supported by appropriate
aircraft photography as necessary, our objective furthermore is to
accomplish the following:

1. Develop and test in a few selected areas of the western United
States a standard format for an ecological and land use legend for making
natural resource inventories on a simulated global basis.
2. Based on these same limited geographic areas, identify the
potentialities and limitations of the legend concept for the recognition
and annotation of ecological analogs and environmental complexes.

(E72-10185) A SCHEME FOR THE UNIFORM
MAPPING AND MONITORING OF EARTH RESOURCES
AND ENVIRONMENTAL COMPLEXES C.E. Poulton,
et al (Earth Satellite Corp., Berkeley,
Calif.) 10 Nov. 1972 6 p

N73-10364

Unclas
00185

CSCI 08B G3/13

An additional objective is to determine the optimum combination of space photography, aerial photography, ground data, human data analysis and automatic data analysis for estimating crop yield in the rice growing areas of California and Louisiana.

Major Accomplishments

- a. Interpreters have been examining ground truth records on 35mm slides and correlating these slides with tape recorded verbal flight logs dictated by the principal investigators during their August ground truth mission.
- b. High-flight U2 imagery over the test areas is being used as an intermediate stage for defining vegetation analogue test areas which will be examined in more detail during the next reporting period.
- c. The ecological legend is being tested by application to vegetational analogues reported in a cross-section of the literature dealing with our various test areas or their environs. The tests show good applicability and usefulness of the legend in most areas, but have indicated some areas where classification problems will need additional attention.
- d. Complete coverage from ERTS-1 has been received only for the Lahontan, Nevada test site. The coverage of this area provides views of part of the Northern Great Valley area and we have used that imagery successfully for preliminary analysis of the agricultural areas where a rice study will be conducted in 1973. We have received cloud-free imagery covering only the west side and southern portion of our Colorado Plateau test site. This is in the arid analogue area. The imagery for

this area is of good quality and usable. We have received insignificant coverage of the forest types in this test area. No coverage is in hand for the Louisiana Coastal Plain test site.

e. Preliminary evaluation of these areas as seen on the ERTS imagery has been made and tentative calibration areas have been designated within which intensive image study and analysis will begin in the next report period.

f. Our project has been recognized as a "cornerstone" experiment by the EROS Program Office, USDI. We welcome this opportunity to collaborate with them in their study titled, "Evaluation of Economic, Environmental and Social Costs and Benefits of Future Earth Resources Survey Satellite Systems." We filed a special report on the values of side-lap stereo in the human interpretation of ERTS-1 imagery with NASA on 6 September 1972 and the P.I. presented a 5-minute discussion of the subject at the GSFC ERTS-1 Seminar.

Work Schedule

We are progressing according to plan on the imagery we have received. No imagery has been received from the coastal plain site and although we plan to investigate the 1973 rice crop, data obtained from one mission in 1972 will be most helpful in selecting specific areas for study which include examples of various yield-limiting and environmental conditions. We, therefore, have requested coverage from one date in 1972 of the coastal plain.

Cloud-free imagery has not been received from the timberlands at higher elevations in the Colorado Plateau area.

Color composites of selected frames have been ordered but not received. We are not proceeding as planned in areas for which we have not received imagery. A delay in submission of the continuing data analysis plan may result if some color imagery is not received soon.

Problems

We submitted a letter on October 25, 1972 detailing two problems relating to photo quality. One problem involves the presence of Newton rings on the 70mm positive images. These blemishes make the transparencies unusable for interpretation. The other problem relates to the overly dense 70mm negatives being supplied by NDPF.

Since our October 25 letter another problem has arisen. Many of the 9.5 x 9.5 paper prints are overly dense and unusable for interpretation. In such instances we are reordering prints. In some cases we are reprinting, at additional expense, the unusable images required for interpretation.

Aerial photographs taken by EarthSat from a company-operated aircraft have been extremely useful in calibrating features and areas to be studied in this project. These photos will be very useful for documenting legend features in our reports.

Extended delays in receiving color composites ordered retrospectively will cause problems in analysis of data. We are also requesting an early delivery of NASA U2 aircraft photography. Our image analysis will proceed as planned, using acceptable imagery where available.

We wish to express our pleasure with the prints of high quality for the purposes of our investigation. NASA should be commended for the success of the ERTS-1 spacecraft.

Funding

Some unplanned expenditures are being encountered because of the need to make additional negatives and prints where quality was unsatisfactory and where NDPF could not respond to our needs for reprints in the time period required. Other costs are within budget at this time.

Personnel

No change.

Plans for Next Reporting Period

We plan to prepare a detailed scheme for data analysis as required in our contract prior to proceeding with the study. We will simulate the methods to be used in 1973 in our agricultural study in the Coastal Plain and Northern Great Valley rice fields by analysis of imagery obtained by ERTS-1 and support aircraft in 1972. From these investigations we will develop a detailed data analysis plan for submission to our contracting officer.

Aerial photos taken by NASA and EarthSat will be correlated with ERTS-1 imagery for intensive use in evaluating the usefulness of space photos for uniform mapping of earth resources.

We will conduct several vegetation mapping tests on U2 and ERTS-1 imagery. The purpose of these tests will be to further explore the use and validity of the vegetational analogue legends we have developed.

Hopefully, we will receive the color composites we have ordered and begin some preliminary comparisons of these images with the images of the several spectral MSS bands.

Report prepared by

Charles E. Poulton and
Robin I. Welch
EARTH SATELLITE CORPORATION
Berkeley, California

